WORKSHOP REPORT-5

NATIONAL WORKSHOP ON COLD CHAIN FOR VACCINES

December 28 - 30, 1981

राष्ट्रीय स्वास्थ्य एवं परिवार कल्याण संस्थान
NATIONAL INSTITUTE OF HEALTH AND FAMILY WELFARE,
NEW DELHI

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Community Health
Library and Information Centre (CLIC)
Community Health Cell
85/2, 1st Main, Maruthi Nagar,
Madiwala, Bengaluru - 560 068.
Tel : 080 - 25531518
email : clic@sochara.org / chc@sochara.org
www.sochara.org

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Workshop Report 5

NATIONAL WORKSHOP ON COLD CHAIN FOR VACCINES

(December 28-30, 1981)

Organized by

NATIONAL INSTITUTE OF HEALTH AND FAMILY WELFARE
New Mehrauli Road, Munirka, New Delhi-110067

Assisted by

DIRECTORATE GENERAL OF HEALTH SERVICES
New Delhi

1984

1984, by the NIHFW, New Delhi

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PREFACE

High incidence of sickness and death among children is largely due to infectious diseases. Many of such diseases can be prevented through vaccination. The Expanded Programme on Immunisation has, therefore, been initiated in the country to make vaccination services available to all eligible children and pregnant mothers. It is expected to reduce the incidence of diseases like diphtheria, tetanus, pertusis, polio-myelitis, tuberculosis and typhoid. The programme will gradually include other selected diseases as and when necessary.

One of the major constraints in the delivery of effective immunisation services is the Cold Chain. Proper maintenance of the Cold Chain is essential to increase the vaccination target. Workers in the field, particularly in rural areas, are confronted with many problems relating to the maintenance of existing Cold Chain facilities for their maximum utilisation.

Such problems need to be identified and proper remedial measures have to be found out to achieve the objectives under the EPI Programme. Accordingly, the present workshop was organised by the National Institute of Health and Family Welfare in collaboration with the Directorate General of Health Services, New Delhi with financial assistance from WHO.

The workshop has, to my mind, achieved its objectives to a great measure. This collaborative effort will certainly bring a good dividend in such an area of national concern. The workshop has brought out some important recommendations which, I am sure, will go a long way in strengthening the existing Cold Chain system in the country.

Somnath Roy
Director

December 30, 1981

INTRODUCTION

At the meeting of the Governing Body of the National Institute of Health and Family Welfare (NIHFW) held on 27th June, 1981, it was suggested that the Institute should organise a "Workshop on Cold Chain for Vaccines" for senior health administrators at the State level and other connected officials for effective implementation of the Expanded Programme on Immunization (EPI).

Accordingly, this national Workshop on Cold Chain for Vaccines was organised by NIHFW in collaboration with the Directorate General of Health Services (DGHS), New Delhi from December 28-30, 1981 with financial assistance from WHO.

OBJECTIVES

The main objectives of the Workshop were:

i. To review the existing Cold Chain system and its problems.

ii. To update the inventory of Statewise Cold Chain facilities available at various levels.

iii. To formulate plans, long-term and short-term, to improve the Cold Chain and suggest some alternative approaches.

iv. To finalise plan of action for developing refrigerator maintenance and repair service.

v. To recommend methods of monitoring and evaluating the Cold Chain.

PARTICIPANTS

The participants of the workshop were Senior Health Administrators, Family Welfare Officers and State level EPI

Officers, representatives of the Central Research Institute, Kasauli and Airport Health Office, Delhi and Medical Officers from district and PHC. Nine States, namely, Orissa, Maharashtra, Punjab, Himachal Pradesh, Jammu and Kashmir, Rajasthan, Karnataka, Meghalaya and Haryana were represented in the workshop. Officials from WHO/SEARO, UNICEF, New Delhi, DGHS, and NIHFW, New Delhi also participated. There were altogether 25 participants for the above workshop (vide Annexure I).

PROGRAMME AND METHODOLOGY

In his welcome address, Prof. Somnath Roy reviewed the existing Cold Chain system and stressed the crucial role of PHC in immunization services. He highlighted some of the problems related to the system as revealed in a study conducted by the Administrative Staff College of India, Hyderabad. Prof. Roy asked the workshop participants to think of some alternative strategy to immunization services in view of the existing constraints (vide Annexure II).

The workshop was inaugurated by Shri J.S. Baijal, Additional Secretary-cum-Commissioner, Family Welfare on 28th December, 1981. In his address, he stressed the need for increasing the vaccination coverage of infants and children, particularly in rural areas. He spoke on various aspects of the system such as supply and maintenance of Cold Chain equipments, inventory of refrigerators, training and motivation and evaluation and monitoring. Shri Baijal urged the participants to examine the existing system critically and suggest some practical and realistic steps for the improvement of the Cold Chain (vide Annexure III).

The workshop was designed to combine individual work, group sessions and plenary sessions. There were five plenary sessions and two group sessions in the Programme (vide Annexure IV). Two plenary sessions on Management of Cold Chain and Review of Cold Chain Problems preceded group works. Two plenary sessions were devoted to Delivery of Immunization Services and Cold Chain during the Sixth Plan. On the first day, the participants were divided into three groups for working on a Module of Cold Chain Management developed by WHO. On the second day, the participants discussed in groups different areas of the Cold Chain such as Review of the Existing Cold Chain and its problems, Development of Refrigerator Maintenance and Repair Services and Monitoring of the Cold Chain system. The three groups elected their own chairmen and rapporteurs. The groups deliberated on various

issues involved, discussed in depth the problems faced and finally came out with certain practical recommendations. The findings of the three groups were presented in the last plenary session on the third day and the recommendations were finalised. The observations and recommendations of the workshop were presented in the concluding session.

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The following background materials were supplied to the participants: (i) Expanded Programme on Immunization; (ii) The Cold Chain for Vaccines; (iii) The Cold Chain Equipment; (iv) Delivery of Immunization Services - An Alternative Approach; and (v) Module on Cold Chain Management developed by WHO. A film show on the Cold Chain was also exhibited to the participants. An exhibition on Immunization Programme including Cold Chain equipments was put up in posters, charts, demonstration materials etc. for the benefit of the participants.

The Programme was coordinated by Dr. R.N. Basu, Assistant Director General (EPI), DGHS, New Delhi and Dr. A.K. Sen, Assistant Professor, National Institute of Health and Family Welfare, New Delhi.

RECOMMENDATIONS OF THE WORKSHOP

Controlling diseases through the Expanded Programme on Immunization is dependent on administration of potent and effective vaccines. Vaccines can retain potency provided they are transported and stored at recommended temperatures. The three groups of participants discussed various aspects of the Cold Chain system. Their recommendations are summarised below:

Logistics of Vaccine Distribution

The Central Research Institute (CRI), Kasauli, supplies more than three-fourths of the requirements of vaccines to the States and Union Territories. At present, vaccines are booked from the Indian Airlines office at Chandigarh. A limited number of packets can be handled in a day. The vaccines have to be unloaded and loaded again at Delhi for despatching to the consignees. Considering the problem of trans-shipment and delay involved, it is recommended that, the vaccines be brought from Kasauli to Delhi and booked at Palam Airport. There are direct flights to most parts of the country from Delhi.

It is recommended that a suitable insulated truck, with required staff be provided to CRI exclusively for transporting vaccine from Kasauli to Delhi.

It is noted that no cold room facility is available at Palam Airport. As vaccines are likely to be stored at Airport for a day or two, it is recommended that the Airport authority/ Indian Airlines be requested to build a cold room at the airport for storing biologicals, including vaccines, during trans-shipment.

The Airport Health Officer can play an important role in quick despatch of vaccines, checking their storage and transferring them in thermocole boxes (containing Measles and Polio vaccines). It is recommended that looking after the vaccines be included in the job-description of the Airport Health Organisation. They should keep constant liaison with Indian Airlines and vaccines manufacturers.

The manufacturer should send advance intimation to the consignee about the despatch of vaccines. The packet should be properly labelled such as 'Vaccine - Rush', and indicate the address of the consignee including the telephone number.

EPI Officers should maintain rapport with the local Indian Airlines office so that the intimation of arrival of vaccine is communicated immediately.

A proforma for acknowledgement of receipt of vaccine should accompany each consignment. The consignee should return the proforma duly filled in to the manufacturer, indicating that the vaccine was received in good condition.

A cold room or bank of refrigerators (for use in a small State and Union Territory) has to be arranged for bulk storage of vaccines at State level. This can be done by hiring space in private cold storage. The cold room attached with the State vaccine institute should be expanded and renovated for this purpose.

At the State/district level, one single officer should be designated for coordinating the receipt, storage and distribution of all vaccines. The system of indent is to be developed so that there is no accumulation of stock at any level or shortage at any point of time.

Vaccines must not be sent from State headquarters to the district by rail or road unaccompanied. Vaccines must be sent through a courier. Adequate travel cost for the courier or POL for a vehicle has to be provided.

Vaccine should be supplied from the division to the

district once in a month. The dial thermometer should be available with each refrigerator for the person in charge to record temperature.

Vaccine from district headquarters to PHC should be supplied once a month, properly packed in ice box. Vaccine from PHC to the peripheral level should be carried in vaccine carrier. Unconsumed vaccine after the day's work should be deposited back in the refrigerator by the vaccinator at PHC.

Maintenance of Cold Chain Equipment

All refrigerators and deep freezers used for storage of vaccine at the State/district level should be put in one place under the charge of one person for easy maintenance. There should be provision for a stand-by generator for use in times of power failure.

Only 5,657 (65%) of the available 7,155 refrigerators for vaccine storage are in working condition. Facilities for their repair and maintenance exist only in nine States. It is recommended that a permanent Health Equipment Repair Unit be established in the States where no such services exist and strengthen the units in other States where some infrastructure is available.

The Health Equipment Repair Units should concentrate on the repair and maintenance of refrigerators. The minimum staff recommended per unit is one technician, one electrician and one driver, which will be able to cover 40 to 50 Primary Health Centres.

To repair the 35 per cent of non-working refrigerators, it is recommended to initiate a crash programme for survey and repairs. Provision has to be made for providing additional funds for temporary recruitment of staff for short periods in addition to the supply of spare parts and tools.

For full coverage and effective organisation of Health Equipment and Repair Units, it is recommended that the scheme be included as sponsored by the Government of India in the plan of operation of UNICEF assistance for the supply of tools and spare parts.

The Government of India should organise practical orientation training courses for refrigerator technicians with the assistance of international agencies. State Governments may prepare a list of technicians to be trained for future appoint-

ment as refrigerator mechanics.

In future, UNICEF should supply refrigerator through local dealers, so that their services can be utilised for installation and during the guarantee period.

UNICEF may be requested to supply ice lining refrigerators in future in order to overcome the problem of erratic power supply.

Voltage fluctuation is frequent in many places and there are instances of continued low voltage in some areas. It is recommended to provide voltage stabilisers to all refrigerators.

Regular checking of temperature etc. in refrigerators/cold rooms/deep freezers should be done and factual conditions noted in the form of charts particularly for proper checking of power failures.

Suitable pamphlets to highlight the importance of the Cold Chain and its proper use indicating Do's and Don'ts should be provided.

Monitoring of Cold Chain

The inventory of refrigerators for storage of vaccine at the State, district and PHC levels should be up-dated periodically. The report of non-functioning refrigerators should be sent to the higher level immediately for corrective action.

The dial thermometer should be put in all working refrigerators. A record of temperature should be maintained regularly for inspection of supervising officers.

The 'Cold Chain Monitor' which indicates the period for which the vaccine was exposed to higher temperature should be used as an experiment in a few batches of vaccine to understand the functioning of existing Cold Chain.

Samples of polio and DPT vaccine should be collected by the Central/State EPI Officer from the field for despatch to CRI, Kasauli for potency test. For this, DGHS and CRI have to develop the protocol and programme.

Research and Evaluation

Medical Colleges/NIHFW/other concerned institutions

should be encouraged to conduct appropriate investigations including serological and epidemiological studies to assess the immunity level after vaccination.

NIHFW/other concerned institutions should take up epidemiological studies and operational research to find out alternative strategies for immunization services on the basis of prevalence of diseases among children in a particular area, logistic problems and other related factors.

Evaluation of the Cold Chain system should be done regularly at the inter-State level, from one State to another and also by a Central Team consisting of the representatives of WHO/UNICEF/Government of India and identified institutions.

ANNEXURE I

LIST OF PARTICIPANTS

STATE LEVEL

1. Dr. Dhee Banerjee
   Deputy Director (MCH)
   Orissa

2. Dr. Sukhdarshan Dev
   Assistant Director (EPI)
   Punjab

3. Dr. S.P. Kapoor
   Director of Health Services
   Himachal Pradesh

4. Dr. Krishan Lal
   Director of Health Services
   Jammu and Kashmir

5. Dr. T.M. Ramesh
   Deputy Director (EPI)
   Karnataka

6. Dr.(Mrs.) Deborah Roy
   Deputy Director of Health Services
   Meghalaya

7. Dr. T.S. Sahai
   Deputy Director of Health Services (CD)
   Medical Directorate
   Rajasthan

8. Dr. Indu Sharma
   Assistant Director (MCH)
   Haryana

9. Dr. B.M. Sirsikar
Assistant Director of Health Services (EPI)
Maharashtra

10. Dr. S.M. Tripathy
Deputy Director (EPI)
Orissa

DISTRICT LEVEL

11. Dr. R.Y. Bhange
District Health Officer
Raigad, Maharashtra

PHC LEVEL

12. Dr. R.S. Parashar
Medical Officer-in-Charge
PHC Gangapur, Rajasthan

CENTRAL RESEARCH INSTITUTE, KASAULI

13. Dr. S.N. Saxena
Acting Director
Central Research Institute
Kasauli (Himachal Pradesh)

AIRPORT HEALTH OFFICE, DELHI

14. Dr. T. Verghese
Airport Health Officer
Delhi

INTERNATIONAL ORGANISATION

15. Mr. Nasim Ahmed
Consultant
UNICEF
New Delhi

16. Mr. Carl Forsmark
Head, Transport, Equipment & Maintenance Services
UNICEF
New Delhi

17. Miss A. Vishalakshmi
Programme Officer
Health and Nutrition Section
UNICEF
New Delhi

18. Dr. Rafi Aslanian
Medical Officer
WHO/SEARO
New Delhi

DGHS, NEW DELHI

19. Dr. R.N. Basu
Assistant Director General (EPI)
DGHS
Nirman Bhavan, New Delhi

20. Dr. Jotna Sokhey
Deputy Assistant Director-General (EPI)
DGHS
Nirman Bhavan, New Delhi

21. Dr. B.N. Mittal
Deputy Assistant Director General (EPI)
DGHS
Nirman Bhavan, New Delhi

NIHFW, NEW DELHI

22. Prof. Somnath Roy
Director
NIHFW
New Delhi

23. Dr. Shakuntala Bhatnagar
Professor of Epidemiology
NIHFW
New Delhi

24. Dr. A.K. Sen
Assistant Professor of Education & Training
NIHFW
New Delhi

25. Dr. I.S. Allag
Assistant Research Officer
Department of Reproductive Biomedicine
NIHFW
New Delhi

ANNEXURE II

PROGRAMME

MONDAY - DECEMBER 28, 1981

0930-1000 hrs.	Registration
1000-1100 hrs.	Welcome - Prof. Somnath Roy
	Inauguration - Shri J.S. Baijal
1100-1130 hrs.	Tea Break
1130-1300 hrs.	Workshop Methodology
	Review of Vaccine Distribution System
	Speaker: Dr. R.N. Basu
1300-1400 hrs.	Lunch Break
1400-1530 hrs.	Plenary Session - I - Management of Cold Chain
	Chairman: Dr. R.N. Basu Speaker: Dr. A.K. Sen
1530-1545 hrs.	Tea Break
1545-1700 hrs.	Group Session - I - Module of Cold Chain Management
	Group A, Group B and Group C.

TUESDAY - DECEMBER 29, 1981

0930-1100 hrs.	Group Session - I continued.

1100-1130 hrs.	Tea Break
1130-1200 hrs.	Plenary Session - II - Review Cold Chain Problems
	Chairman: Dr. Krishan Lal Speaker: Dr. Jotna Sokhay
1200-1300 hrs.	Group Session - II
	- Review the existing Cold Chain and its Problems
	- Development of Refrigerator, Maintenance and Repair Services
	- Monitoring and Evaluating the Cold Chain
	Group A, Group B and Group C
1300-1400 hrs.	Lunch Break
1400-1530 hrs.	Group Session - II continued
1530-1545 hrs.	Tea Break
1545-1700 hrs.	Group Session II - continued

WEDNESDAY- DECEMBER 30, 1981

0930-1100 hrs.	Plenary Session - III - Delivery of Immunization Services - Alternative Approach and Monitoring of Services
	Chairman: Dr. S.P. Kapoor Speakers: Dr. R.N. Basu Dr. S. Bhatnagar Dr. I.S. Allag
1100-1130 hrs.	Tea Break
1130-1300 hrs.	Plenary Session - IV - Presentation of Group Work, Finalisation of Observations and Formulation of Recommendations
	Chairman: Dr. S.P. Kapoor Speaker: Dr. S.N. Saxena

1300-1400 hrs.	Lunch Break
1400-1500 hrs.	Plenary Session - V - Cold Chain during Sixth Plan
	Chairman: Dr. S.P. Kapoor
	Speaker: Dr. R.N. Basu
1500-1630 hrs.	Concluding Session
	Address by Dr. S.K. Verma
	Address by Dr. N. Dutta Banik

ANNEXURE III

PLANNING COMMITTEE

1.	Prof. Somnath Roy Director, NIHFW	Chairman
2.	Dr. S.K. Sengupta	Member
3.	Dr. R.N. Basu	Member
4.	Dr. S. Bhatnagar	Member
5.	Dr. R.S. Gupta	Member
6.	Dr. A.K. Sen	Convenor-Member

ANNEXURE IV

Welcome Address

by

Prof. Somnath Roy*

Genesis of the Workshop

During the meeting of the Governing Body of the Institute held on 27th June, 1981, it was suggested by the then Additional Secretary-cum-Commissioner (Family Welfare) that this Institute should organise a Workshop on Cold Chain for Vaccines for Senior Health Administrators at the State level and other officials connected closely with the programme as this aspect of the Expanded Programme on Immunization (EPI) needed reinforcement for effective implementation of the programme. Accordingly, this Institute decided to organise the present National Workshop in collaboration with the Directorate General of Health Services (DGHS), New Delhi from December 28-30, 1981.

Vaccination Targets

The Expanded Programme on Immunization was started in the country in January 1978 with the objective of reducing the incidence of diphtheria, pertusis, tetanus, poliomyelitis, tuberculosis and typhoid fever by making vaccination services available to all eligible children and pregnant women by 1990. Other selected diseases were to be included when and where felt necessary. It was also aimed to achieve self-sufficiency in the production of vaccine required for the programme.

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*Director, National Institute of Health and Family Welfare, New Delhi-110067.

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Kamamangala
Bangalore

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Keeping in view the objective of 'Health for All by the Year 2000 AD', the working group on health has recommended 85 to 100 per cent coverage of pregnant women and eligible children with all vaccines except polio vaccine by 1990.

The 'Cold Chain' System

The 'Cold Chain' is a system of transport and storage of vaccines at low temperature from the manufacturer to the point of use. Under the existing system in the country, vaccines are supplied by air from the manufacturing institutes to State headquarters or to a number of receiving points in the State. Prior intimation is given so that the vaccines are cleared immediately on arrival at the airport. Vaccines are stored either in the cold rooms of local vaccine manufacturing institutes, hired space in private cold stores or in refrigerators. The vaccines are transported from State receiving points to district headquarters where vaccines are stored in refrigerators. Usually, monthly/quarterly supplies are made to the districts on the basis of their utilisation reports. The vaccines are distributed from district headquarters to PHCs monthly. PHCs collect the vaccines from the district office either on the monthly conference day when the doctors come for meeting or by sending a person to the district office. Lady Health Visitors or in some cases ANMs draw the necessary stock from PHCs at periodic intervals and carry them to the vaccination sessions at the sub-centre, villages, schools, etc. in vaccine carriers and thermosflasks.

A study on Vaccine Distribution System conducted in 1978 by the Administrative Staff College of India in the five project districts covered under India Population Project (IPP) Scheme in Karnataka, has identified the problems faced by the immunization programme and recommended system modifications towards removing these problems.

The study reveals that a major portion of the exposable life (life outside refrigerators) of vaccine (7 to 8 days) is used up before reaching the District Health Office. This exposable life during which vaccines need not be stored carefully, is a flexibility that should be available to PHCs and the field staff so that vaccines retain their potency till they are injected into the beneficiary. It is also pointed that there is lack of proper control in the existing system from the Public Health Institute (PHI) level down to the District Health Office and Primary Health

Centre level in the delivery of vaccine. In fact, greater concern over the target achievement without corresponding provision of facilities and system would result in the immunization programme being an achievement in terms of number rather than in terms of protection against diseases to the children and expectant mothers.

Lack of system support to the Immunization Programme would seriously affect the efficacy of the programme. The study therefore recommended a system with strengthening of several sub-systems in order to improve the existing situation, in the light of the existing constraints within which the system would have to function. The additional expenditure involved is small compared to the benefits expected. This workshop needs to consider these important aspects.

Delivery of Immunization Services

In providing immunization services in rural areas, PHCs play a most crucial role. In PHCs stock of vaccine is maintained in refrigerator. But about 40 per cent of PHCs do not have refrigerators in working condition. They are out of order needing repairs. Electricity is not regularly available in rural areas. There are severe voltage fluctuations and frequent power cuts. We are thinking of providing kerosene refrigerator for use in areas where regular supply of electricity is not available. But kerosene is a rare commodity in rural areas. Cold boxes for transport of vaccine require ice or cold pack. The thermosflask used by the para-medical workers to carry vaccine for day to day operation also requires ice to keep the vaccine cold. But again ice is often not available in the countryside. Keeping the vaccines in earthen pots full of water in a cool place to minimise their deterioration by LHVs/ANMs might have only marginal effect on retaining their potency. Under the conditions stated above, potency of a vaccine is bound to deteriorate and if the vaccines do not retain their required potencies till they are administered to the beneficiaries, the real purpose of EPI is likely to be defeated.

In fact, the study mentioned above, has highlighted some of the important problems related to the immunization programme and has posed a challenge to all of us in proper management of the immunization services with a view to providing effective protection to children and expectant mothers against the targeted diseases.

Within the existing constraints prevailing in the

country, can we think of some alternative strategy to overcome the problems relating to immunization services? Can we provide effective refrigerator maintenance and repair service? How should we evaluate and monitor the Cold Chain? How should we formulate a suitable plan of aotion for improvement of the existing Cold Chain system? Can we find out the effectiveness of immunization by determining the antibody litre in the blood of the beneficiaries? Would it be worthwhile to organise selective and concentrated immunization programme on the basis of the epidemiological findings, rather than spreading them over meagre resources? These are some of the important issues that you, as policy makers and implementators, would like to discuss in this present workshop.

I am sure the recommendations emerging out of the workshop will go a long way in strengthening the Cold Chain system in the country to improve the immunization services being provided to mothers and children.

ANNEXURE V

INAUGURAL ADDRESS

by

Shri J.S. Baijal*

It gives me great pleasure to participate in the inaugural session of the Workshop on the Cold Chain for Vaccines and welcome you all to the workshop. In our country, the major causes of sickness and death of children are infectious diseases. Fortunately, many of these diseases are preventable by immunization. Infant mortality rate, which is considered as an important index of both health and development of a country or region, is still very high in our country. One out of eight children die before they complete one year. While the overall mortality has been reduced to nearly half from 27 per thousand persons in 1941-50 to less than 15 in 1971-80, infant mortality rate has been fluctuating at a high level of 125 to 140 per thousand live-births. However, it is a matter of some satisfaction that the infant mortality rate in urban areas has decreased from 90 in 1970 to 70 in 1978. It may be of interest to you that while the post-natal mortality among infants, most of which is preventable by immunization, has declined in urban areas from 41 in 1970 to 28 in 1978. This has fluctuated between 53 and 70 in rural areas. Child mortality is also quite high in rural areas and less in urban areas. Expansion of the Cold Chain to provide immunization cover to children in our vast rural populations is thus a matter of urgent necessity. Provision of adequate maternal and child care is not only important in improving their quality of life but also for ensuring the acceptance of the small family norm and hence reducing rapidly our high population growth rate.

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*Additional Secretary-cum-Commissioner (Family Welfare), Ministry of Health and Family Welfare, Government of India, Nirman Bhavan, New Delhi.

The expanded programme on immunization is one of the important activities of the Ministry of Health and Family Welfare and I am glad to say that a lot of work has been initiated both by the Central and State Governments for the success of the programme. Vaccination coverage of infants and children is, however, not as satisfactory as we would like it to be, particularly in our rural areas, and there is urgent need to get down together to look into the problems and try to find ways of solving them.

Cold Chain

Although vaccines are effective and comparatively cheap tools in our hands to control many diseases they need to be handled carefully. It is no use vaccinating children with vaccines that are no longer effective. The Cold Chain has been a major constraint in our not being able to significantly increase the vaccination targets. I am aware of the problems faced in the field but I feel that the facilities already available are not being put to maximum use. I am sure that the participants of the workshop will examine the existing Cold Chain system at various levels for optimising its use and I look forward to your suggestions and recommendations.

Supply of Refrigerators and Other Cold Chain Equipment

We have been seriously occupied with the problems relating to storage and transportation of vaccines and would like to cooperate with the State health authorities in the improvement of the Cold Chain system.

Besides the supply of a large number of refrigerators to the PHCs, subsidiary health centres, MCW Centres, Urban Paediatric Units and other immunization centres with UNICEF assistance under the Rural Health Services and other programmes, it has now been decided to replace all old refrigerators imported over ten years ago for which spare parts may not be readily available or repairs otherwise uneconomical. Additional refrigerators are also being supplied to strengthen the storage facilities at the district level.

Inventory Refrigerators

Refrigerators have been supplied by the Central Government over many years under various programmes. Many

refrigerators have also been purchased by the State Health Authorities.

An up-to-date inventory of the refrigerators available at various levels seems to me essential for planning and their coordinated use. It will also help identify PHCs which need new refrigerators or replacement of condemned ones.

Maintenance of the Cold Chain Equipment

According to information available with us, at any given time at least one-third of the refrigerators lie out of order, many due to minor defects. Either due to cumbersome administrative procedures or due to difficulties in getting trained mechanics to visit out of the way rural areas, these do not get repaired for a long period. I hope the group will look into the possibilities of setting up small repair units for the preventive maintenance and timely repair of refrigerators particularly in rural areas. I have been informed that such units are operating successfully in some States. The Ministry of Health and Family Welfare will be glad to assist the State health authorities to set up such units if such a request is received from them.

Training and Motivation

Without properly trained and motivated personnel, it is difficult to sustain the Cold Chain even when adequate facilities are available. The Ministry of Health and Family Welfare has organised many training courses. These were mostly for the senior level people in the State health directorates who could later take the responsibility of organising similar courses in their respective States. Even when formal courses are not feasible, health workers should be thoroughly briefed on the handling of vaccines and the importance of the Cold Chain.

Evaluation and Monitoring

Since the success of the immunization programme depends to a large extent on how the vaccines have been stored and transported it is essential that some methods be evolved for monitoring and evaluation of the Cold Chain system. To give a sense of urgency, I suggest that all the officers may be requested to monitor the Cold Chain during visits to the immunization centres. Besides checking temperature and other records, it should be ensured that large

amounts and date expired vaccines are not in stock.

Concluding Remarks

We have with us here to help us in our deliberations the representatives of WHO and UNICEF. Both these organisations have actively participated in our national health programmes, including the immunization programme. I would like to thank them for their interest and support.

I thank you once again for taking time off your busy schedules to come here and participate in the workshop. All of you are senior officers with many years of experience and I am confident the workshop will be able to suggest practical, realistic and immediate steps for the improvement of the Cold Chain.